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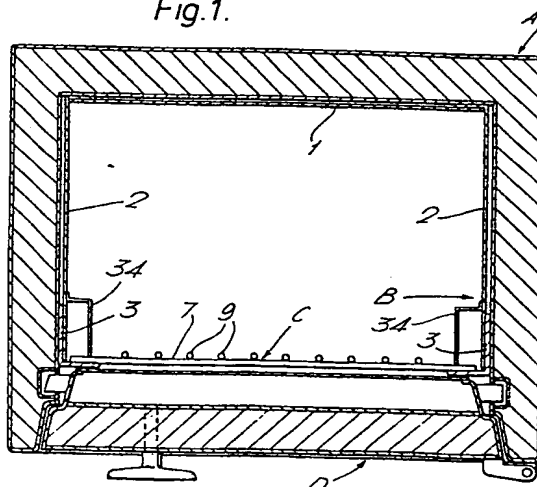
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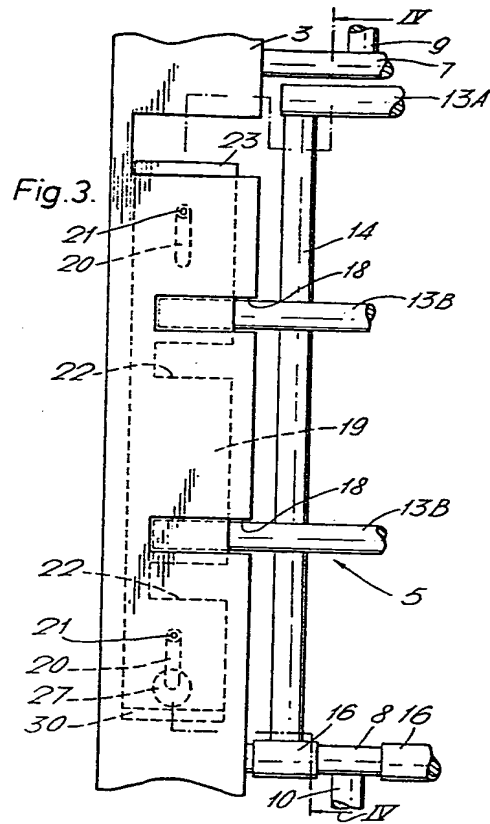
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(54) Security receptacles and screen units therefor.

(57) A night deposit safe (A) has a grille (C) fitted behind its main door (D). In the event of an attack with explosives introduced into the safe through the deposit trap the explosion pressure wave is transmitted through the grille to the main door (D) so that even if the pressure force is sufficient to dislodge the latter the integrity of the grille is retained and acts as an impediment to the ready removal of the safe's contents. The grille (C) has a hinged centre section (5) to permit bank staff to remove deposits during the working day, this section normally only being latched; however, a locking bolt (24) is released by a glass tube (31) to lock the grille centre section (5) closed when the tube (31) is shattered by explosive force. The grille (C) can be embodied in a lining (B) for retro-fitting to an existing safe (A); this form of construction avoids problems in mounting a grille directly to the internal finishing skin of the receptacle.

Fig.1.





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Security Receptacles and Screen Units therefor

The present invention relates to safes and the like security receptacles.

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One known form of attack for obtaining unauthorised access to the contents of a safe or the like is to introduce explosives into the interior of the receptacle which, when detonated, generate sufficient pressure  
10 within the receptacle to detach or dislodge its door. In particular so-called night deposit safes are vulnerable to this type of attack, as the trap which is provided for the deposit of cash or other valuables by authorised customers can also provide a comparatively  
15 simple route for the introduction of the requisite explosive charge.

It is an aim of the invention to provide a means for improving the resistance of security receptacles to the  
20 above-described form of explosive attack and in accordance with one aspect of the invention a grille, lattice or other reticulated screen is fitted behind the main penetration-resistant door of a safe or the like security receptacle, the screen being sufficient to  
25 prevent ready access to the contents of the receptacle

when the door is open; at least a portion of said screen being movable to a condition in which access to the contents of the receptacle is permitted thereby; and means for locking said screen portion against such  
5 movement. Such a screen can be constructed and arranged so that it will remain in place even after an internal-explosion of sufficient force to detach or dislodge the associated main door of the receptacle, it being understood that by virtue of its reticulated form there  
10 is a minimal cross-sectional area of material in the screen as viewed normal to its plane over which the explosion pressure acts and hence only a relatively low pressure force can be exerted on the screen by such an explosion.

15  
In accordance with a preferred feature of the invention the aforesaid screen can be provided in a unit suitable for retro-fitting to existing safes and the like, although of course such screens can also be installed at  
20 the time of manufacture of relevant receptacles. In the case of a retro-fitted screen it may be incorporated in a unit in the form of a lining to fit within the interior of the receptacle, comprising for example a generally continuous planar rear portion and two side  
25 portions across the front of which the screen is fixed. This lining can be secured within the receptacle such as by welding, screwing or some other suitable technique, although in this respect it is of note that in general a relatively light form of fixation of the lining to the  
30 receptacle will suffice. This is because in the event of an explosion within the receptacle the pressure force exerted upon the planar rear portion of the lining will far exceed that which can be exerted upon the screen itself, so that the tendency of the explosion is for the  
35 screen unit as a whole to be pressed further into,

rather than forced out of, the receptacle. Providing the screen in a unit of this nature which can be designed reliably to maintain its integrity and its position within the receptacle under explosive  
5 conditions thus avoids the problems which may be encountered in retro-fitting a screen at the desired position across the interior of an existing safe by mounting the screen directly to the internal finishing skin of the receptacle - such skins frequently will not  
10 have been designed to provide the load-bearing capacity required for such mounting.

The aforesaid movable portion of the screen (which may be hinged to a fixed part of the screen or otherwise  
15 borne for its movement) can if desired be locked by any convenient known form of selective locking mechanism. It is preferred, however, that the locking means includes an explosion-responsive device which will automatically operate to lock that screen portion in the  
20 event of the detection of an explosion (or other gross shock) within the receptacle, such device comprising for example a bolt which is biased towards a locking position but which is normally held away from that  
position by a glass or other frangible element, the  
25 frangible element being arranged to disintegrate and thereby release the bolt into its locking position when subject to an explosive or similar shock. In certain circumstances it is of advantage if one or more such explosion-responsive devices are the only locking means  
30 provided for the movable screen portion - for example in the case of a night deposit safe which must be cleared frequently by bank staff it is an unnecessary inconvenience to have to separately unlock the screen on each occasion when deposited valuables are to be removed  
35 from the safe, or to require the provision of keys for

this purpose separate from the keys or combination for the main safe door, particularly bearing in mind that it is only in the event of an explosive or like attack being sustained that the additional security afforded by the screen is needed.

A preferred embodiment of the invention in the form of a screen unit for retro-fitting to a night deposit safe will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic horizontal cross-section through a safe fitted with the screen unit, details of the unit's locking means being omitted for clarity of illustration;

Figure 2 is a front elevation of the screen unit of Figure 1;

Figure 3 is an enlarged view of a portion of Figure 2;

Figure 4 is a section on the line IV-IV of Figure 3; and

Figure 5 is a section on the line V-V of Figure 4.

Referring to Figure 1, there is shown a conventional night deposit safe A into which has been fitted a screen unit B. The screen unit is in the form of a lining which fits closely within the internal volume of the safe, and includes a back portion 1 and two side portions 2 fabricated from relatively thin (say 3mm) steel plate. The side portions 2 of the screen unit are

stiffened at their front edges by thicker steel angle sections 3, and a reticulated screen C is fixed across the front of the lining, between the sections 3, so as to lie immediately behind the main penetration-resistant door D of the safe. Depending upon the design of the safe A to which the screen unit C is fitted, the back portion 1 of the lining may be perforated or relieved to the extent necessary to provide an entry from an associated deposit trap, but in any event it extends over at least a major part of the inside rear surface of the safe when installed. The lining is secured within the safe eg by a number of spot welds, for the reason previously mentioned a relatively light form of fixation of the lining to the safe being sufficient.

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Referring to Figure 2, the screen C is made up of three sections of grillework 4,5,6. The upper and lower grilles 4 and 6 are fixed rigidly in place and in the illustrated embodiment each comprises four steel laterals 7,8 welded between the angle sections 3 and to which are welded ten steel verticals 9,10. The central grille 5 is hinged about a horizontal axis so as to open outwards and downwards from the position shown in the drawings, and in the illustrated embodiment is made up from three steel laterals 13A, 13B to which are welded eleven steel verticals 14. The grille 5 is in fact hinged to the lower grille 6, by bushes 16 fixed to the lower ends of the verticals 14 and borne upon the upper lateral 8 of the grille 6. The apertures 11,12 and 15 in the three grille sections are sized so as not to pass the standard money cassettes intended for use with the deposit trap associated with the safe.

The ends of the two laterals 13B in grille 5 extend behind the angle sections 3 and the grille is prevented from pivoting inwards relative to the safe by the abutment of these ends with channel sections 17 welded to the respective lining sides 2 (one of which is seen in Figures 4 and 5). The front flanges of the angle sections 3 are provided with notches 18 at the heights of the laterals 13B to allow the ends of those laterals to pass the sections 3 as the grille 5 is opened outwards. However, and with more particular reference now to Figures 3 and 4, the grille 5 is normally kept in its closed position by a latching bar 19 provided at each side, each bar 19 being borne for limited vertical translation behind a respective section 3 by slots 20 in the bars running over studs 21 fixed to the sections 3. The bars 19 are biased to their lower positions, as illustrated, under their own weight, in which positions they block the notches 18 against passage by the laterals 13B. However the bars 19 also have notches 22 which can be aligned with the notches 18 to permit such passage by the laterals 13B simply by raising the bars by lifting respective tabs 23 provided at their upper ends.

25 In normal usage, therefore, when the main door D of the safe is opened, bank staff have no difficulty in opening the grille 5 whenever it is required to remove deposited valuables from the safe. However in the event of an explosive attack on the safe, such as may be successful in detaching or dislodging the main door, automatic locking means associated with each bar 19, and now to be described, come into operation to hold down those bars and thereby prevent the grille 5 from being opened.



With reference to Figures 4 and 5, each locking means comprises a bolt 24 having a shank 25 slidably borne in a slot 26A in one flange 26 of the respective channel section 17 and an enlarged head 27 slidably borne in an aperture 28A in the other flange 28 of the section 17. Each bolt is biased by a spring 29 compressed between its head 27 and the flange 26 of the respective section 17 towards a position in which the bolt head is projected to lie in the path of a lower tab 30 on the respective bar 19 to prevent the bar from being raised. Normally, however, the bolt is held away from its locking position by a glass tube 31 surrounding the respective bolt shank 25 and held between the flange 26 and a washer 32 retained on the bolt by a pin 33. A cover plate 34 protects the bolt 24 from tampering and the glass tube 31 from impact by deposited valuables falling into the safe.

Let it now be supposed that at some time when the safe is closed and locked (that is by the usual locks associated with the main door D) an attack is perpetrated by the introduction and detonation of an explosive charge within the interior of the safe. At the front of the safe the explosion pressure is transmitted to the main door through the apertures 11,12,15 in the compound grille 4-6 and it may be that if the explosion is of sufficient force the main door will be detached or at least dislodged by the blast to a degree such that access to the valuables deposited in the safe could be gained in the absence of any additional preventative measure. The net effect of the explosion pressure on the lining/screen unit B, however, is not to eject the screen from the front of the safe but rather to press the unit into the safe, it being understood that the cross-sectional area of material in

the grille 4-6 as viewed normal to its plane over which the explosion pressure acts is minimal so that little force is exerted on the grille tending to eject it, whereas this pressure integrated over the whole of the  
5 area of the rear portion 1 of the lining exerts a significantly greater force in the opposite direction. Furthermore, as the glass tubes 31 are subjected to the shock of the explosion pressure wave they will shatter to remove their restraint on the movement of the bolts  
10 24, which latter are accordingly shot under the bias of the springs 29 to lock down the bars 19.

It follows that after an attack of the above-described nature, even if the barrier constituted by the main door  
15 D should be overcome the grille 4,5,6 can remain in place and with the normally movable portion 5 automatically locked. A grille as described and illustrated herein is sufficient to prevent the ready access to, and removal of, valuables deposited in the  
20 safe. Clearly such a grille cannot provide the same degree of resistance to penetration by thermal and mechanical cutting tools as does a conventional safe door - but that is the province of the main door, not of the grille. It will be understood that if a successful  
25 explosive attack is to be mounted on a safe and particularly on a night deposit safe which is sited close to the street - once the explosion has been detonated very little time is available for collecting and escaping with the valuables. Any additional barrier  
30 such as the locked grille 4,5,6 which needs to be overcome subsequent to the explosion, therefore, is liable to require that the attack is abandoned.

CLAIMS

1. A safe or the like security receptacle having a reticulated screen fitted behind the main penetration-resistant door of the receptacle, the screen being sufficient to prevent ready access to the contents of the receptacle when said door is open; at least a portion of said screen being movable to a condition in which access to the contents of the receptacle is permitted thereby; and means for locking said screen portion against such movement.
2. A receptacle according to claim 1 wherein said movable screen portion is hinged about a horizontal axis to open outwards from the receptacle.
3. A receptacle according to claim 2 wherein said movable screen portion is normally prevented from opening by movable latching members juxtaposed to each side edge thereof; the latching members being biased to first positions in which they obstruct opening movement of said screen portion but being movable to second positions in which they are withdrawn from such obstruction.
4. A receptacle according to claim 3 wherein said latching members obstruct the opening movement of one or more lateral elements of said screen portion when the latching members are in their said first positions; but said latching members are configured to pass said lateral element(s) when moved to their said second positions.

5. A receptacle according to any preceding claim wherein said locking means comprise an explosion-responsive device arranged automatically to lock said movable screen portion in the event of the detection of  
5 an explosion or the like shock within the receptacle.

6. A receptacle according to claim 5 wherein said explosion-responsive device comprises a bolt which is biased towards a locking position but is normally held  
10 away from that position by a frangible element which element is adapted to disintegrate to release the bolt into its locking position when subjected to an explosion or the like shock within the receptacle.

15 7. A receptacle according to claim 5 or claim 6 when appended to claim 3 or claim 4 wherein a said explosion-responsive device is juxtaposed to each side edge of said movable screen portion and the respective bolts thereof are adapted to lock respective said latching  
20 members in their said first positions.

8. A screen unit in the form of a lining to be fitted within the interior of a safe or the like security receptacle, the unit comprising a generally  
25 continuous planar rear portion joined by side portions to a reticulated screen which extends across the front of the unit so as to lie behind the main penetration-resistant door of said receptacle when the unit is fitted therein; the screen being sufficient to prevent  
30 ready access to the contents of a said receptacle when fitted therein and the main door thereof is open; at least a portion of said screen being movable to a condition in which access to the contents of a said receptacle is permitted thereby when fitted therein;  
35 and further comprising means for locking said screen portion against such movement.

9. A screen unit according to claim 8 and having the characteristics defined in any one of claims 2 to 7.
11. A screen unit according to claim 8 and  
5 substantially as hereinbefore described with reference to the accompanying drawings.
10. A safe or the like security receptacle fitted with a screen unit in accordance with any one of claims  
10 8 to 10.

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Fig.1.

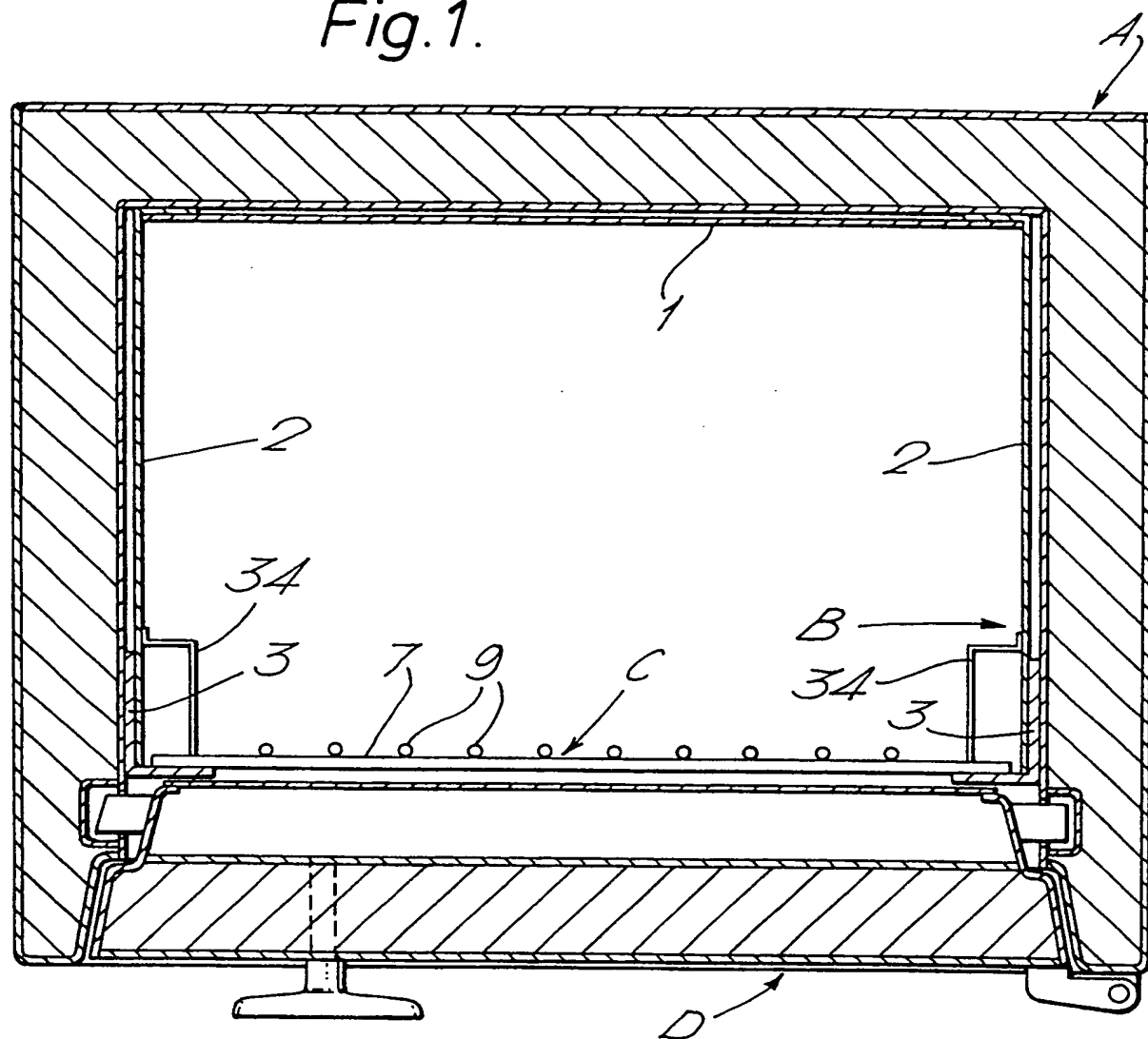


Fig.5.

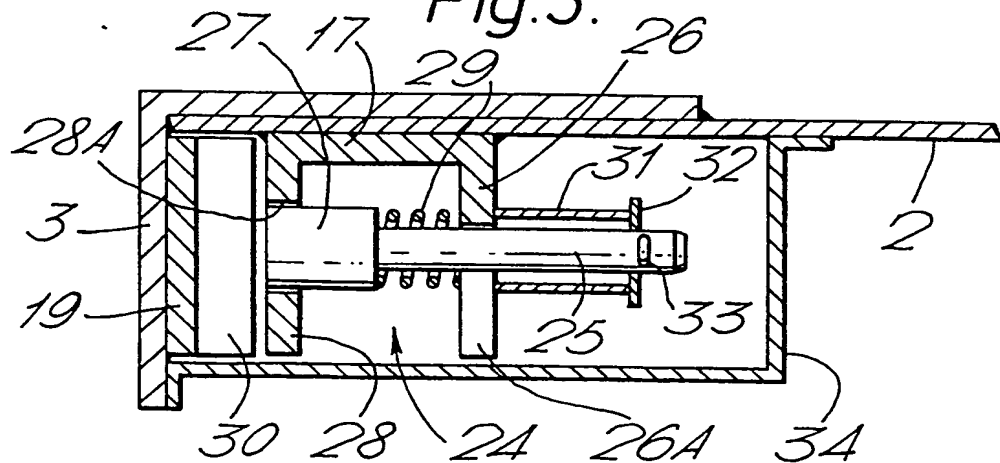
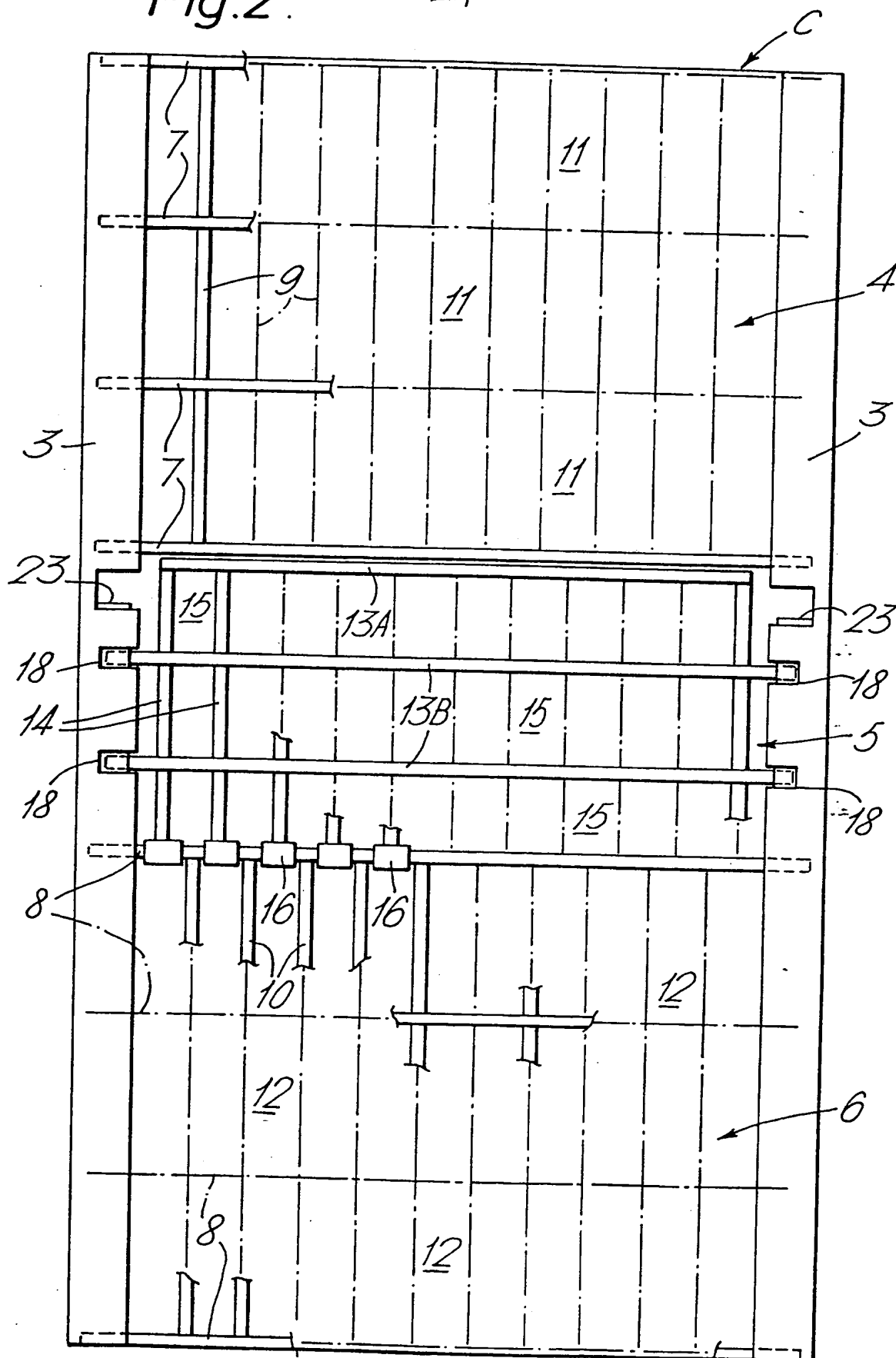
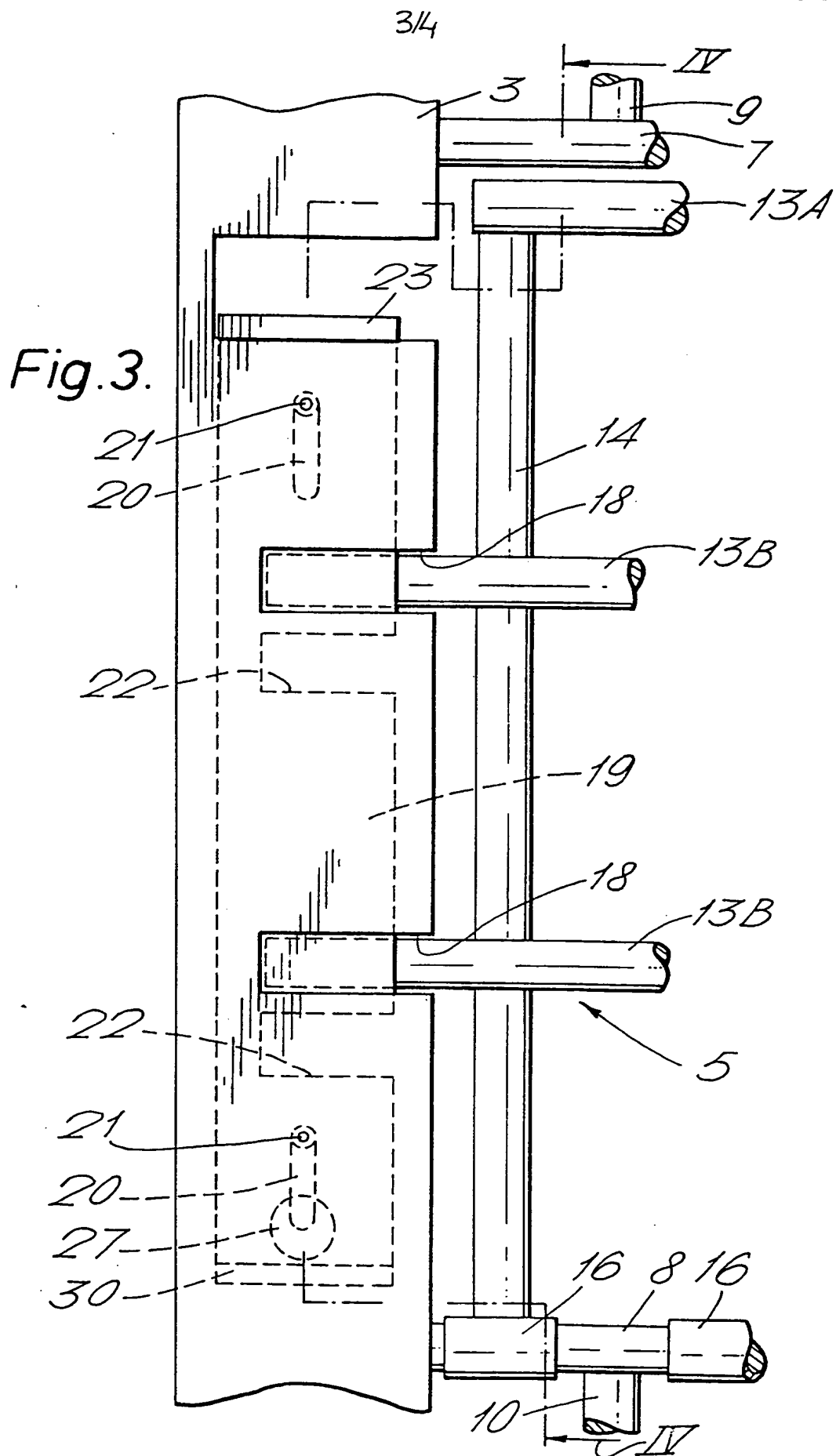


Fig. 2.

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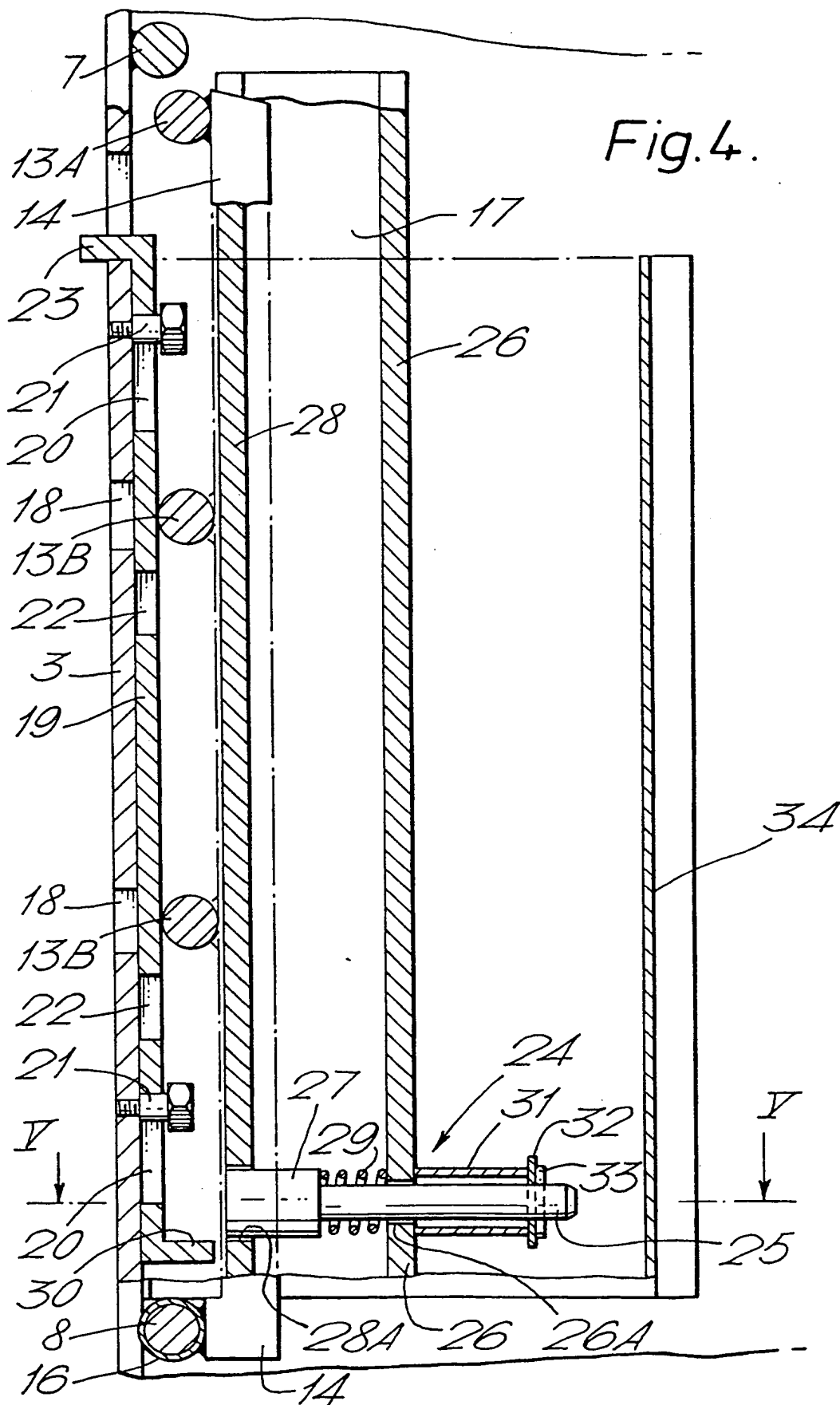






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Fig. 4.





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# EUROPEAN SEARCH REPORT

0080769

Application number

EP 82 20 1488

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	--- US-A-3 329 106 (LINGAL) *Column 2, lines 3-20; figure 1*	1,8	E 05 G 1/025
A	--- FR-A-1 017 502 (FRAISSANGE) *Page 1, column 2, last paragraph; page 2, column 1, first paragraph; figure 1*	3,4	
A	--- AU-B- 424 812 (CHUBB'S AUSTRALIAN CO., LTD.) *The whole document*	5,6,7	
A	--- US-A-1 516 531 (HALTEMAN) -----	2	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			E 05 G E 05 B E 05 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-03-1983	Examiner NEYS B.G.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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